

Docket No. F-8435

Ser. No. 10/511,958

**APPENDIX I****ALL PENDING CLAIMS WITH AMENDMENTS EFFECTED THEREIN**

1. (Currently Amended) A light receiving or light emitting panel, comprising:

a plurality of granular semiconductor elements that have a light-to-electricity transducing function or electricity-to-light transducing function;

a light transmitting printed wiring sheet comprising:

a first flat surface;

a plurality of retaining holes disposed in a form of a matrix having a plurality of rows and a plurality of columns, and

printed wiring which is formed on said first flat surface;

said semiconductor elements each comprising:

an element main body made of a p type or n type semiconductor,

a pn junction, and

a pair of electrodes that are electrically connected to respective ends of the pn junction with a center of the element main body interposed between the electrodes; and

the plurality of semiconductor elements being aligned in a common conductive direction and being respectively disposed and held in said retaining holes,

the pair of electrodes of each semiconductor element being connected to said printed wiring;

plural semiconductor elements, of said granular semiconductor elements, in each row or column parallel to said conductive direction being connected in series via said printed wiring; and

A I - 1

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Docket No. F-8435

Ser. No. 10/511,958

plural semiconductor elements, of said granular semiconductor elements, in each column or row perpendicular to said conductive direction being connected in parallel via said printed wiring.

2. (Currently Amended) A light receiving or light emitting panel according to claim 1, wherein a transparent covering material is provided which covers in embedded form said printed wiring sheet and the plurality of semiconductor elements held by the printed wiring sheet.

3. (Currently Amended) A light receiving or light emitting panel according to claim 2, wherein said printed wiring sheet is constructed from a thin sheet material made of a transparent hard synthetic resin.

4. (Currently Amended) A light receiving or light emitting panel according to claim 2, wherein said covering material is a soft synthetic resin material, and the light receiving or light emitting panel is constructed with a structure deformable into a curved surface wherein said rows or said columns are curved.

5. (Currently Amended) A light receiving or light emitting panel according to claim 2, wherein said covering material is a hard synthetic resin material forming a hard flat-plate structure.

6. (Currently Amended) A light receiving or light emitting panel according to claim 2, wherein, for at least a plurality of said semiconductor elements, the element main body and the pn junction are spherical and said pair of electrodes are connected to the printed wiring of the printed wiring sheet.

7. (Currently Amended) A light receiving or light emitting panel according to claim 2, wherein, for at least a plurality of said semiconductor elements, the element main body and the pn junction are cylindrical and said pair of electrodes are connected to the printed wiring of the printed wiring sheet.

A 1 - 2

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Docket No. F-8435

Ser. No. 10/511,958

8. (Original) A light receiving or light emitting panel according to claim 2, wherein a plurality of partially spherical lens parts are formed in positions corresponding to the plurality of semiconductor elements in surface parts of the covering material on a light receiving or light emitting side of said light receiving or light emitting panel.

9. (Original) A light receiving or light emitting panel according to claim 2, wherein a plurality of partially cylindrical lens parts are formed in positions corresponding to respective columns or respective rows of the plurality of semiconductor elements in surface parts of the covering material on a light receiving or light emitting side of said light receiving or light emitting panel.

10. (Currently Amended) A light receiving or light emitting panel in which a plurality of particulate semiconductor elements that have a light-to-electricity transducing function or electricity-to-light transducing function are incorporated in a planar fashion, characterized in that a light transmitting printed wiring sheet that is used to position, hold and electrically connect said plurality of semiconductor elements is provided, and the printed wiring sheet comprises:

a plurality of retaining holes disposed in a form of a matrix having a plurality of rows and a plurality of columns, through which a plurality of semiconductor elements are passed, and which hold intermediate parts in a height direction of the semiconductor elements,

printed wiring which is formed on a surface of the printed wiring sheet which electrically connects the plurality of semiconductor elements,

wherein a reflective film for reflecting light is formed in surface parts on an opposite side from a light receiving or light emitting side of said light receiving or light emitting panel.

11. (Cancelled)

12. (Original) A light receiving or light emitting panel according to claim 4, wherein a pair of projecting pieces that correspond to at least a pair of

A1-3

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Docket No. F-8435

Ser. No. 10/511,958

electrodes of each semiconductor element, and that are bent so as to contact the pair of electrodes, are formed on an outer edge portions of the respective retaining holes of said printed wiring sheet.

13. (Currently Amended) A light receiving or light emitting panel in which a plurality of particulate semiconductor elements that have a light-to-electricity transducing function or electricity-to-light transducing function are incorporated in a planar fashion, characterized in that a light transmitting printed wiring sheet that is used to position, hold and electrically connect said plurality of semiconductor elements is provided, and the printed wiring sheet comprises:

a plurality of retaining holes disposed in a form of a matrix having a plurality of rows and a plurality of columns, through which a plurality of semiconductor elements are passed, and which hold intermediate parts in a height direction of the semiconductor elements, and

printed wiring which is formed on a surface of the printed wiring sheet which electrically connects the plurality of semiconductor elements,

wherein both surfaces of said covering material are formed as parallel flat surfaces, and glass plates or glass sheets are disposed on these surfaces.

14. (Currently Amended) A light receiving or light emitting panel according to claim 2, wherein both surfaces of said covering material are formed as parallel flat surfaces, a glass plate or glass sheet is disposed on a flat surface of said flat surfaces on a light receiving or light emitting side, and a reflective film for reflecting light is disposed on another flat surface of said flat surfaces on an opposite side from said flat surface.

15. (Original) A method for manufacturing a light receiving or light emitting panel in which a plurality of particulate semiconductor elements that have a light-to-electricity transducing function or electricity-to-light transducing function are incorporated in a planar fashion, this method being characterized by comprising:

AI - 4

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Docket No. F-8435

Ser. No. 10/511,958

a first step in which a plurality of semiconductor elements and a light-transmitting printed wiring sheet material are prepared;

a second step in which a printed wiring for connecting said plurality of semiconductor elements is formed on said printed wiring sheet material;

a third step in which a printed wiring sheet is manufactured by punching a plurality of retaining holes in said printed wiring sheet material in a form of a matrix that has a plurality of rows and a plurality of columns; and

a fourth step in which respective semiconductor elements are inserted into the plurality of retaining holes in said printed wiring sheet, to hold intermediate portions in a direction of height of these semiconductor elements, and a pair of electrodes on each semiconductor element are electrically connected to said printed wiring.

16. (Original) A light receiving or light emitting panel manufacturing method according to claim 15, wherein a pair of electrodes of each semiconductor element are electrically connected to said printed wiring by disposing pieces of metal with a low melting point in the vicinity of this pair of electrodes, and irradiating these metal pieces with a heating beam.

17. (New) The light receiving or light emitting panel according to claim 1 wherein said light transmitting printed wiring sheet has a second surface opposing said first flat surface and lower portions of the semiconductor elements extend below the second surface.

18. (New) The light receiving or light emitting panel according to claim 2, wherein reflective films for reflecting light are formed in surface parts on an opposite side from a light receiving or light emitting side of said light receiving or light emitting panel.

19. (New) A light transducing panel, comprising:  
semiconductor elements that have a light-to-electricity transducing function or electricity-to-light transducing function;

A 1 - 5

PAGE 23/25 (0010) : wml

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Docket No. F-8435

Ser. No. 10/511,958

a light transmitting printed wiring sheet functioning to position, hold and electrically connect said semiconductor elements;

the printed wiring sheet comprising:

a flat material having a first flat surface;

a plurality of retaining holes disposed in said first flat surface in a form of a matrix having a plurality of rows and a plurality of columns, the semiconductor elements being respectively disposed in said retaining holes, and

printed wiring which is formed on said first flat surface which electrically connects the semiconductor elements;

said semiconductor elements each having an element main body made of a p type or n type semiconductor, a pn junction, and a pair of electrodes that are electrically connected to respective ends of the pn junction; and

the printed wiring of the printed wiring sheet connecting the pairs of electrodes in a configuration wherein:

the pn junctions of the semiconductor elements in each of the rows are electrically connected in series with each other of the pn junctions of the semiconductor elements in respective ones of the rows such that, for each of the rows, the pn junctions in the row are serially connected with each other; and

the pn junctions of the semiconductor elements of each of the columns are electrically connected in parallel with each other of the pn junctions of the semiconductor elements in respective ones of the columns such that, for each of the columns, the pn junctions of the semiconductor elements in the column are connected in parallel with each other.

20. (New) The panel of claim 19 wherein said semiconductor elements have upper and lower portions respectively disposed above and below said first flat surface, and intermediate parts between said upper and lower portions which are connected to said flat material.

A I - 6

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Docket No. F-8435

Ser. No. 10/511,958

21. (New) The panel of claim 19 wherein said pairs of electrodes have a center of the element main body interposed between the electrodes.

A1 - 7

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